

IN THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) An echo cancellation unit comprising:
an adaptive filter to generate a current echo model;
a convergence metric computation unit; and
a model store to store the current echo model from the adaptive filter as a saved model
in response to an indication from the convergence metric computation unit when a data
interruption occurs.
2. (Original) The echo cancellation unit of claim 1 further comprising:
a distance measurement unit to measure a distance between the current echo model
and the saved model; and
a threshold comparator responsive to the distance measurement unit to facilitate
restoring the saved model as the current echo model.
3. (Currently Amended) The echo cancellation unit of claim 1 [[2]] wherein the current
echo model in the adaptive filter has a plurality of coefficients, and wherein the model store
stores a subset of the plurality of coefficients.
4. (Original) The echo cancellation unit of claim 2 wherein the distance measurement
unit is coupled between the adaptive filter and the model store to facilitate a distance
measurement between the current echo model and the saved model for a plurality of time lags.
5. (Original) The echo cancellation unit of claim 1 further comprising a reconvergence
unit to restore the saved model as the current echo model.
6. (Original) The echo cancellation unit of claim 5 wherein the reconvergence unit
comprises:
a distance measurement unit to compare the current echo model and the saved model
over a plurality of time lags; and
a comparator coupled to the distance measurement unit, to restore the saved model as
the current echo model at a matching time lag.

7. (Original) A speakerphone system comprising:
an output device to drive a speaker, the output device being responsive to a reference node coupled to a communications channel;
an input device responsive to a microphone; and
an echo cancellation unit coupled to the reference node and the input device, such that the echo cancellation unit utilizes data from the reference node to remove echo from a signal received at the microphone;
wherein the echo cancellation unit includes a model store to store a current echo model when a real-time error occurs.
8. (Currently Amended) The speakerphone system of claim 7 wherein the speakerphone system is implemented in a computer, and wherein the echo cancellation unit is implemented in software, the echo cancellation unit being coupled to the input device and to the reference node using memory in the computer.
9. (Currently Amended) The speakerphone system of claim 7 wherein the echo cancellation unit further includes a real-time error detector to detect when the ~~the~~ real-time error has occurred, and to direct the model store to receive the current echo model, to create a saved model, wherein the system further comprises a FIFO, wherein the real-time error includes at least one of data interruption, delayed data, lost data, a data timing error, a streaming error, and the FIFO at least one of overruns and underruns.
10. (Original) The speakerphone system of claim 9 wherein:
the echo cancellation system includes an adaptive filter having an input power and an output power; and
the real-time error detector is coupled to the adaptive filter to compare the input power and the output power of the adaptive filter.
11. (Original) The speakerphone system of claim 9 wherein the echo cancellation unit further includes a reconvergence unit to compare the current echo model with the saved model.

12. (Original) The speakerphone system of claim 11 wherein the reconvergence unit is coupled between the model store and the adaptive filter to compare the current echo model with the saved model for a plurality of time lags, and to conditionally replace the current echo model with the saved model at a matching time lag.

13. (Currently Amended) The speakerphone system of claim 9 wherein echo return loss enhancement is measured by the real time error detector, and wherein the [[a]] real-time error is detected when an inversion in echo return loss enhancement occurs abruptly.

14. (Canceled)

15. (Currently Amended) A method comprising:

reconverging an adaptive filter using computer implementation, wherein the reconverging includes:

storing an echo model when a data timing error occurs to create a stored model;

comparing a current model in the adaptive filter with the [[a]] stored model, and replacing the current model with the stored model when a match is found within a distance measure;

determining a convergence metric value that describes a level of convergence of the adaptive filter; and

comparing the current model with the stored model when the convergence metric value is above a threshold.

16. (Currently Amended) The method of claim 15 wherein determining the [[a]] convergence metric value comprises computing a ratio of adaptive filter output power to adaptive filter input power, wherein the data timing error includes at least one of data interruption, delayed data, lost data, a real-time data error, and a streaming error.

17. (Previously Presented) A method comprising:

reconverging an adaptive filter using computer implementation, wherein the reconverging includes:

comparing a current model in the adaptive filter with a stored model, and replacing the current model with the stored model when a match is found within a distance measure, wherein comparing comprises:

normalizing the stored model;
normalizing the current echo model; and
measuring a Euclidean distance between the stored model and the current echo model.

18. (Currently Amended) A method comprising:
recognizing an ~~[[the]]~~ occurrence of a real-time data interruption error; and
reconverging an adaptive filter, wherein recognizing and reconverging include
includes:
detecting the real-time data interruption error;
saving a current echo model in the adaptive filter as a saved model in a model
store;
resetting the adaptive filter such that convergence begins anew;
comparing an emerging echo model in the adaptive filter to the saved model;
and
replacing the emerging echo model with the saved model when a match is
found.

19. (Currently Amended) The method of claim 18 wherein detecting the real-time data interruption error comprises:
comparing an adaptive filter output power to an adaptive filter input power; and
when the adaptive filter output power is greater than the adaptive filter input power,
recognizing that the ~~[[a]]~~ real-time data interruption error has occurred.

20. (Currently Amended) The method of claim 18 wherein detecting the real-time data interruption error comprises:
measuring echo return loss enhancement; and
when the echo return loss enhancement inverts, recognizing that the ~~[[a]]~~ real-time
data interruption error has occurred abruptly.

21. (Currently Amended) The method of claim 18 wherein saving the ~~[[a]]~~ current echo
model comprises searching the current echo model for a portion that includes a direct path and
reverberations, and saving the portion as the saved model.

22. (Original) The method of claim 18 wherein comparing the emerging echo model with the saved model comprises:

for each of a plurality of time lags, computing a distance between the emerging echo model and the saved model to find a matching time lag.

23. (Original) The method of claim 22 wherein replacing comprises replacing the emerging echo model with the saved model shifted by the matching time lag.

24. (Currently Amended) An article having a machine readable medium with instructions for performing a method of reconverging an adaptive filter disposed thereon, the method comprising:

saving a current echo model from the adaptive filter as a saved model in a model store when one or more of a data timing error, a data interruption, delayed data, lost data, a real-time data error, and a streaming error occurs;

resetting the adaptive filter to start converging anew;

comparing an emerging echo model with the saved model; and

replacing the emerging echo model with the saved model when a match is found.

25. (Original) The article of claim 24 wherein comparing the current echo model with the saved model comprises:

performing a distance measure between the emerging echo model and the saved model at a plurality of time lags.

26. (Currently Amended) The article of claim 24 further comprising:

prior to saving a current echo model, determining if the one or more errors have a real-time error has occurred by comparing an adaptive filter output power to an adaptive filter input power.

27. (New) The echo cancellation unit of claim 1 wherein the data interruption includes at least one of data loss and delayed data.

28. (New) The method of claim 15 further comprising:

comparing an adaptive filter output power to an adaptive filter input power; and

when the adaptive filter output power is greater than the adaptive filter input power, recognizing that the data timing error has occurred.

29. (New) The method of claim 17 further comprising:
measuring echo return loss enhancement; and
when the echo return loss enhancement inverts, recognizing that a data interruption has occurred.

30. (New) The method of claim 17 further comprising:
comparing an adaptive filter output power to an adaptive filter input power; and
when the adaptive filter output power is greater than the adaptive filter input power, recognizing that a streaming data interruption error has occurred.